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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/781,564
Filing Date: February 13, 2001
Appellant(s): OKUNO ET AL.

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GROUP 2600

Brian K. Seidleck
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 06/30/2006 appealing from the Office action mailed 09/03/2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

Appellant is unaware of any related Appeal or Interference.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,563,733	Mitsuda et al.	10-1996
6,028,698	Ogoshi et al.	02-2000
6,404,525	Shimomura et al.	06-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1, 3-4, 6, 8, 9, 11, 13-14, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,563,733 to Mitsuda et al (hereinafter Mitsuda) in view of U.S. Patent No. 6,028,698 to Ogoshi et al (hereinafter Ogoshi).

Regarding claim 17, Mitsuda discloses an optical transmission method applied to an optical transmission system (Fig. 6) comprising an optical transmission line (34 of Fig. 6) through which a plurality of signal light components having wavelengths different from each other (Col. 1, lines 66-67 and Col. 2, line 1) included in a predetermined wavelength band are transmitted; a plurality of optical amplifiers (e.g. optical fiber amplifying sections, 31, 32, and 33 in combination with 11, 12 and 13 of Fig. 6 respectively and Col. 2, lines 35-37) installed on said optical transmission line, each having a wavelength-dependent noise figure (e.g. 0.98 μm pump light of 11, 12 and 13 improves noise figure, Col. 13, lines 46-50); a first signal multiplexing section (21 of Fig. 6), installed upstream said plurality of optical amplifiers (e.g. upstream from 31, 32 and 33 of Fig. 6) in a signal light propagating direction (via 34 of Fig. 6), for guiding a first signal light component into said optical transmission line (34, 36, 53 and

51 of Fig. 6 and Col. 7, lines 36-38); a second signal multiplexing section (22 of Fig. 6) installed between said plurality of optical amplifiers (e.g. between 31 and 32 of Fig. 6), for guiding a second signal light component into said optical transmission line (34, 36, 55, 56, 57 or 52 of Fig. 6 and Col., 7, lines 38-60); and a receiving station (105 of Fig. 17), installed downstream said plurality of optical amplifiers (107 of Fig. 16 or 17), for receiving said first signal light component having a first signal wavelength multiplexed at said first signal multiplexing section and said second signal light component having a second signal wavelength multiplexed at said second signal multiplexing section (Col. 13, lines 17-50 and Col. 17, lines 38-40). Though Mitsuda discloses that the noise figure can be improved through exciting 0.98 μm pump light at the input section of amplifier (Col. 7, lines 64, Col. 8, lines 1-4), he does not explicitly disclose that the first signal light component having said first signal wavelength whose noise figure between said first signal multiplexing section and said receiving station is lower than that of said second signal wavelength is selectively assigned as said signal light component multiplexed at said first signal multiplexing section. Ogoshi discloses first signal light component having said first signal wavelength (e.g. 15 of Fig. 1) whose noise figure between said first signal multiplexing section (14 or 16 of Fig. 5) and said receiving station (52 of Fig. 5) is lower (Col. 1, lines 45-49, Col. 2, lines 42-44 and Col. 4, lines 36-44) than that of said second signal wavelength (e.g. 20 of Fig. 1) is selectively assigned as said signal light component multiplexed at said first signal multiplexing section (e.g. by implementing a 980 nm excitation light source). Accordingly, one of the ordinary skill in the art would have been motivated to incorporate a first signal

wavelength whose noise figure is lower than that of second signal wavelength because the of the optical fiber amplifier is dominated by the noise figure of the front stage and a low noise figure at the input is advantageous to help maintaining its output optical power (Col. 3, lines 43-48 and Col. 4, lines 36-43). Therefore, it would have been obvious to one artisan skill in the art at the time the invention was made to have modified optical fiber transmission system of Mitsuda by having a first signal wavelength at the first multiplexing section that has a lower noise figure than the second signal wavelength at the second multiplexing section because Ogoshi suggests that this is advantageous in maintaining the optical power output.

Regarding claim 16, the limitations introduced by claim 16 correspond to the limitations introduced by claim 17. The treatment of claim 17 above reads on the corresponding limitations of claim 16. There is also one additional limitation introduced by claim 16; that is, a plurality of signal multiplexing sections (e.g. 21 and 22 of Fig. 6, Mitsuda) installed on said optical transmission line connected to an input end side of said optical amplifier (e.g. 51 and 53 are coupled via 21 and 22 at input end for amplification and outputted to 32, Col. 5, lines 39-56, Mitsuda).

Regarding claim 18, the limitations introduced by claim 18 correspond to the limitations introduced by claim 17. The treatment of claim 17 above reads on the corresponding limitations of claim 18. There is also one additional limitation introduced by claim 18: that is, the second section (22 of Fig. 6, Mitsuda) is installed upstream said plurality of optical amplifiers (e.g. upstream from 32 and 33 of Fig. 6, Mitsuda) but downstream said first signal multiplexing section (e.g. downstream from 21 of Fig. 6,

Mitsuda), for multiplexing a second signal light component (55 and 56 of Fig. 6, Mitsuda).

Regarding claim 1, the limitations introduced by claim 1 correspond to the limitations introduced by claim 17. The treatment of claim 17 above reads on the corresponding limitations of claim 1.

Regarding claim 11, the limitations introduced by claim 11 correspond to the limitations introduced by claim 17. The treatment of claim 17 above reads on the corresponding limitations of claim 11. There are also two additional limitations claimed in claim 11; that is; a first multiplexing station (e.g. combination of 21 and 11 of Fig. 6, Mitsuda) and first signal light outputting means (21 outputting 55 of Fig. 6, Mitsuda), and a second multiplexing station (e.g. combination of 22 and 12 of Fig. 6, Mitsuda) and a second signal light outputting means (22 outputting 56 of Fig. 6, Mitsuda).

Regarding claim 6, the limitations introduced by claim 6 correspond to the limitations introduced by claims 17 and 11. The treatment of claims 17 and 11 above reads on the corresponding limitations of claim 6.

Regarding claim 13, Mitsuda in view of Ogoshi discloses a WDM coupler (21, 22, 23, or 24 of Fig. 6, Mitsuda).

Regarding claim 14, Mitsuda in view of Ogoshi discloses an Er-doped fiber amplifier (e.g. earth doped, Col. 5, lines 5-8).

Regarding claims 3 and 8, the limitations introduced by claims 3 and 8 correspond to the limitations introduced by claim 13. The treatment of claim 13 above reads on the corresponding limitations of claims 3 and 8.

Regarding claims 4 and 9, the limitations introduced by claims 4 and 9 correspond to the limitations introduced by claim 14. The treatment of claim 14 above reads on the corresponding limitations of claims 4 and 9.

2. Claims 2, 5, 7, 10, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuda in view of Ogoshi as applied to claims 17 and 11 above, and further in view of U. S. Patent No. 6,404,525 B1 to Shimomura et al (hereinafter Shimomura).

Regarding claim 12, Mitsuda in view of Ogoshi does not explicitly disclose that the signal multiplexing section includes an optical ADM. Shimomura discloses a signal multiplexing section (Fig. 12 or 13) includes an optical OADM (Fig. 3-9) capable of switching wavelengthmultiplexed optical signal (Col. 1, lines 9-12). Accordingly, one of ordinary skill in the art would have provided an optical OADM in order to reduce amount of hardware per transmission optical signal rate and to reduce the cost and system size (Col. 1, lines 43-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the optical transmission system of Mitsuda in view of Ogoshi to incorporate an optical ADM to obtain the invention as claimed in claim 12.

Regarding claim 15, Mitsuda in view of Ogoshi and Shimomura discloses signal wavelength indicating means (e.g. 213 of Fig. 25) for indicating a setting of said signal wavelength for said signal light outputting means in each of said plurality of multiplexing stations according to said noise figure (Col. 29, lines 49-67).

Regarding claims 2 and 7, the limitations introduced by claims 2 and 7 correspond to the limitations introduced by claim 12. The treatment of claim 12 above reads on the corresponding limitations of claims 2 and 7.

Regarding claims 5 and 10, the limitations introduced by claims 5 and 10 correspond to the limitations introduced by claim 15. The treatment of claim 15 above reads on the corresponding limitations of claims 5 and 10.

(10) Response to Argument

The Appellant argues on pages 9-12 of the Brief that the multiplexing stations are installed outside of the optical amplifier and the fluctuation in S/N ratio are reduced according to the correlation between the wavelength dependency of the noise figure and the transmission length. Such system and method are neither disclosed nor suggested by the applied references.

Examiner respectfully submits that Mitsuda discloses erbium-doped optical fibers (e.g. 31, 32 and 33 of Fig. 6) which are notoriously known in the industry to be used as erbium doped amplifiers. According to applicants' drawing of Fig. 1, each multiplexing station comprises multiplexing section and a transmitter coupled with wavelength indicating device. Mitsuda discloses such multiplexing station comprises multiplexing section (e.g. 21 of Fig. 6) and a transmitter coupled with wavelength indicating device (e.g. 11 of Fig. 6 at 0.98/1.55 mm). As shown in figure 6, Mitsuda discloses a first signal multiplexing section 21 installed upstream said plurality of optical amplifiers 31, 32 and 33 in a signal light propagating direction (via 34 of Fig. 6) for guiding a first signal light component (light signal from pump 11) into said optical transmission line (34,

36); a second signal multiplexing section 22 installed between said plurality of optical amplifiers 31 and 32 for guiding a second signal light component (light signal from pump 12) into said optical transmission line (34, 36). Applicant's attention is directed to elements 31, 32 and 33 of Fig. 6 which act as EDFA or optical amplifiers as known, it is clear to one of ordinary skilled in the art that the multiplexing stations (combination of 21 and 11 of Fig. 6) are installed outside of optical amplifiers. The correlation between the wavelength dependency of the noise figure and transmission length is clearly shown by Fig. 2 and Fig. 7B (input power vs. Noise Figure) of Mitsuda (normalized gain vs. signal wavelength). Although the claims are interpreted in light of the specification, limitations such as "the fluctuation in S/N ration are reduced according to the correlation between the wavelength dependency of the noise figure and the transmission length" from the specification are not read into the claims. See In re van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's arguments against the references individually such as Ogoshi et al as drawn to a completely different system from present invention (page 13), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant's argument with respect to issue 2 is based on the arguments of issue 1 and is moot in view of the above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

DT td

10/26/2006

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